REMARKS

Applicants have carefully reviewed and considered the Office Action dated December 17, 2002 and the references cited therein. Applicants have amended claims 18 and 31 in order to improve their form and have added new claim 60. Applicants believe the application is now in condition for allowance. Accordingly favorable reconsideration in light of the above amendments and the following remarks is respectfully requested.

As an initial matter, the Examiner requested a copy of the color transparencies that were discussed during the interview in order to complete the record. Enclosed herewith are copies of those transparencies. The first is a chart listing some of the material angles of repose that applicants have discovered at various point of use locations throughout the world while practicing the present invention. The second document is a chart showing the angles of repose associated with various heaps. Both of these documents were created after the filing date of the present application.

Applicants are also enclosing copies of various other transparencies from a presentation relating to the present invention. Again, this presentation was created after the filing date of the present invention. Some of the documents from the presentation include photographs showing the various material angles of repose, the corner voids and the conical shape of the load heap. Pages 5 and 6 of the presentation documents refer to a body sizing approach that has been developed by Caterpillar, Inc. Applicants became aware of this body sizing approach after the filing date of the present application.

Finally, applicants are enclosing a copy of an SAE technical paper authored by one of the inventors of the present invention. Applicants note that this is just a technical paper and its publication does not indicate that the SAE has adopted any of the contents as a standard.

In the Office Action, claims 16, 18, 29 and 30 stand rejected under 35 U.S.C. § 112 as not being enabled by the specification and as being indefinite. With respect to claim 16, the Examiner specifically objected to the language "comparing the three dimensional volumetric load model with the representation of the actual load collected at the anticipated point of use and adjusting the three dimensional volumetric model...." Applicants submit that this language is amply supported by the specification as filed including for example at page 17, line 29 through page 18, line 9 and FIGS 18A and 18B which describe the iterative design process. With respect to claim 18, the Examiner specifically objected to the phrase "generally rounded-off conical". In response, applicants have amended the claims to return to the original "modeling the corner voids of the hauled material" language that the Examiner has indicated is now acceptable. With respect to claims 29 and 30, the Examiner has objected to the use of the phrase "lowest practical vertical location" as used to describe the center of

gravity of the three dimensional model of the hauled material and the where material is allowed to be loaded into the dump body. Applicants respectfully submit that one skilled in the art would understand the meaning of these phrases based on the explanation in the specification at page 13, line 27 through page 14, line 27. Applicants respectfully request withdrawal of the § 112 rejections.

Turning to the claim rejections based on the alleged prior art, claims 1-15, 18-26, 28-37, 39-53 and 55-59 stand rejected under 35 U.S.C. § 103 as obvious. In support of the rejections, the Examiner primarily relies on the combination of U.S. Patent 5,887,914 ("the '914 patent) and a Caterpillar brochure (Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck"). The Examiner addresses the deficiencies of these two references with respect to the language of the claims by citing different legal precedent and taking official notice of things alleged to be known in the art. Applicants respectfully traverse these rejections.

The combination of the '914 patent with the Caterpillar brochure is the foundation on which the rejection of all the claims is based. This combination is flawed in several critical respects. The Caterpillar brochure must be considered in its entirety, as opposed to discrete sections taken out of context. As provided in claim 1, applicants' claimed invention provides a process by which a vehicle body can be made which takes into account data collected from an anticipated point of use. The collected data can include in different embodiments of the invention various material angles of repose (e.g., the front, rear and side angles of repose), the material density, any load plateau and the loading equipment used. A key step of the process recited in claim 1 is determining the desired volumetric capacity for the body. As explained in the patent specification (see FIG. 18A – Step 2B), the desired volumetric capacity of the body can be calculated by dividing the carrying capacity of the truck chassis by the density of the material which is to be hauled (see FIG. 18A – Step 1A, page 10, line 31 – page 11, line 2).

The data from the anticipated point of use is used to develop a three-dimensional volumetric model of a load to be carried in the body. The design parameters of the body are then considered and the body design adjusted until the load center of gravity is proximate the desired location relative to the truck chassis and the *volume of the three dimensional volumetric model is substantially similar to the desired volumetric capacity.* This is an iterative process whereby if the volume of the three dimensional volumetric model is not substantially similar to the desired volumetric capacity or the center of gravity of the three dimensional volumetric model is not located proximate the desired location relative to the truck chassis; the design parameters of the body are adjusted (e.g., the sidewalls are moved or

heightened, the floor is lengthened, etc.). A new three dimensional volumetric model is then developed based on the same data provided from the anticipated point of use and the new design parameter (e.g., body length, sidewall location) of the body. The volume of this three dimensional volumetric model is then compared to the desired volumetric capacity of the body and the center of gravity of the model is compared to the desired location for the center of gravity of the load relative to the truck chassis. If the volume of the model is substantially the same as the desired volumetric capacity and the center of gravity of the load is properly positioned relative to the truck chassis, then the process is stopped. If they are not substantially the same, the process of adjusting the body design parameters (e.g., body length, sidewall location, sidewall height) and developing a further three dimensional volumetric model is repeated.

As acknowledged by the Examiner, the '914 patent does not disclose developing a three-dimensional volumetric load model using data from an anticipated point of use. Obviously, since it does not teach such a three dimensional volumetric load model, the '914 patent also does not teach the iterative design process whereby a three dimensional volumetric load model is used to help select the design parameters that will produce a body having the desired volumetric capacity and location of the load center of gravity relative to the truck chassis. The Examiner asserts that the claimed process, however, is obvious in view of the following passage from the Caterpillar brochure:

> While field *weight* distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual *weight* studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to *calculate* the published figures for the 769B.

The first significant flaw with the rejection of the claims is that it is based on a misreading of the teachings of the Caterpillar brochure. Specifically, the passage quoted by the Examiner refers to *weight* distribution and *weight* studies, not a three dimensional *volumetric* load model as called for in the claims. The discussion of weight distribution and weight studies in the Caterpillar brochure further makes no reference to material density. Obviously, it will take a much lower volume of iron ore/iron ore pellets (density of approx. 4,000 lbs./cubic yard) to reach the load carrying capacity of the truck chassis than diatomaceous earth (density of approximately 1,350 lbs./cubic yard). The lack of reference to material density highlights a key flaw of the Caterpillar brochure, namely that it fails to teach the step of determining a desired volumetric capacity for the body as called for in claim 1.

The Caterpillar brochure's focus on *weight* distribution is apparent from the "published figures" referred to in the quote, which are found at page 7 of the Caterpillar brochure. These published figures show the weight distribution on the front and rear axles when the 769B truck is hauling a 1.7:1 heaped load. Again, the Caterpillar brochure does not define the material density. As will be understood, materials of different density will require different load heaps to achieve a volumetric payload that would yield a weight payload equal to the carrying capacity of the truck chassis. In contrast to the 1.7:1 heaped load used for the chassis axle weight distribution figures, when presenting the figures for the volumetric capacity of the 769B, this same Caterpillar brochure uses the standard 2:1 SAE model as shown on page 3. It is apparent that while Caterpillar claims to have analyzed "actual weight studies", they have not used those weight studies to rate the volumetric capacity of the 769B body. Other Caterpillar documents from this time period illustrate that Caterpillar consistently rated the volumetric capacity of the 769B using the standard SAE volumetric rating methodology as shown in the highlighted portions of the attached brochures. In sum, the cited Caterpillar brochure does not teach developing a three-dimensional volumetric model using data collected from an anticipated point of use as called for in claim 1.

Moreover, the Caterpillar brochure does not teach or suggest using such a three-dimensional volumetric load model in an iterative design process such as recited in claim 1. In particular, the Caterpillar brochure explicitly states that Caterpillar used the "actual weight studies" (at some unknown material density) to *calculate* published chassis axle weight distribution figures for the 769B. All this suggests is that Caterpillar designed a body having some set of parameters and after the fact used its "actual weight studies" to calculate truck chassis fore and aft axle weight distribution (e.g., how much weight would be on each of the truck axles when the body was loaded). There is no indication that Caterpillar adjusted these "actual weight studies" for varying material densities or used these "actual weight studies" as part of the body design process or with respect to rating the volumetric capacity of the 769B body. In fact, the Caterpillar brochure suggests that they were not used. Moreover, the Caterpillar brochure never mentions the step of "determining a desired volumetric capacity for the body" which is one of the key starting off points for the claimed design process. Thus, in sum, even if the combination were proper, the proposed combination does not teach claim 1.

A further flaw with the rejection of the claims based on the combination of the '914 patent and the Caterpillar brochure is the misapplication of *In re Reinhart*. Applicants concede that *In re Reinhart* sets forth the proposition that scaling up a known process (i.e., one taught in a single prior art reference) is obvious. Yet, this is not a case where applicants

are claiming a different scale of a process that already has been disclosed in the prior art. As the rejection acknowledges, neither the '914 patent nor the Caterpillar brochure disclose all of the steps of the claimed process. Instead, the rejection asserts that it would be obvious to scale down an obvious process, i.e. a process that is obvious from the '914 patent and the Caterpillar brochure. This multi-layered obviousness argument is substantially different, and more tenuous, than the simple scaling-up of a known process proposition of *In re Reinhart*. As such, the rejection cannot be supported by *In re Reinhart*.

A third flaw with the combination of the '914 patent and the Caterpillar brochure is the lack of any motivation to combine their teachings in a manner that would yield the claimed invention, let alone then modifying the combined teachings again based on *In re Reinhart*. When a rejection depends on a combination of prior art references, there must be some teaching, suggestion or motivation to combine the references. As explained by the Court of Appeals for the Federal Circuit:

> To prevent the use hindsight based on the invention to defeat the patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

In re Rouffet, 149 F.3d 1350, 1357 (Fed. Cir. 1998). As the Federal Circuit more recently noted, "[t]he factual inquiry whether to combine references must be thorough and searching. It must be based on objective evidence of record." *In Re Lee*, 277 F.3d 1338, 61 USPQ.2d 1430 (Fed. Cir. 2002). The Federal Circuit went on to warn that the factual question of motivation to combine cannot "be resolved on subjective belief and unknown authority." *Id.* Here, the rejection states the following as the motivation for the rejection:

> One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the "loading techniques and material characteristics" by designing based on a smaller and more specific heaped load pattern data set.

Respectfully, applicants submit that this reasoning is based on improper hindsight. Significantly, to attempt to provide the claimed invention from the '914 patent and the Caterpillar brochure one would have to (1) start with the process disclosed in the '914 patent; (2) turn to the Caterpillar brochure; (3) ignore that the Caterpillar brochure teaches using the results

of the "actual weight studies" simply to calculate a characteristic of a given truck chassis and a given body; (4) choose to use the results of the "actual weight studies" (despite the silence with respect to the different angles of repose and densities of various hauled materials) to design the body; (5) ignore that the Caterpillar brochure teaches using the results of the "actual weight studies" only to calculate truck chassis front/rear axle weight distribution figures; (6) ignore that this same Caterpillar brochure uses the SAE rating standard to rate the volumetric capacity of the body; (7) choose to use the results of the "actual weight studies" to rate the volumetric capacity of the body; (8) ignore that the Caterpillar brochure teaches using a body of the same design characteristics for every point of body use; and (9) choose to use the results of "actual weight studies" from other locations or a new anticipated point of use to design a body custom-designed for that new point of use. There simply is no motivation in either reference or in the prior art as a whole that would support such a series of steps.

In sum, the pending claim rejections, all of which are based in some part on the Caterpillar brochure, should be withdrawn because of the various noted deficiencies of the reference.

Applicants further submit that the Examiner's use of official notice of cone shapes and truncated cone shapes to reject independent claims 31 and 44 is not well taken. While applicants do not contest that cones and truncated cones are known, the Examiner has not identified any motivation in the prior art for using such shapes in a three dimensional volumetric load model and then to use such a three dimensional volumetric load model to design a body. Applicants also note that there is an error in the rejection of independent claim 39. In particular, the rejection repeats the rejection used for claim 31.

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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